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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/827,904	04/06/2001	Ami Ei Agizy	9999	5548

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EXAMINER

ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 02/10/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/827,904	Applicant(s) AGIZY ET AL.	
	Examiner Raymond Alejandro	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4</u> . | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 16. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 1 is objected to because of the following informalities: the second period (.) after the term length in line 10 should be deleted. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5-10 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Regarding claim 5, the phrase "or the like" renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "or the like"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-4, 10-13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al 6248467 in view of Guthrie 6048635.

The instant application is directed to a fuel cell end plate wherein the disclosed inventive concept comprises the specific materials. Other limitations include the specific diameter, content, length and polymers, the calculated resistance, and the end plate function.

With respect to claims 1, 4, 14 (see rejection below):

Wilson et al disclose a bipolar separator plate for fuel cell consisting of a molded mixture of a vinyl ester resin and graphite powder; also, the addition of certain fiber reinforcements and other additives can improve the properties of the composite material (abstract). It is disclosed that the use of thermosetting resins for plate productions offers advantages (col 1, lines 60-68). It is further disclosed that the bipolar plate is formed from a thermosetting resin which may further include short fiber of reinforcements as glass (col 2, lines 30-40). It is further disclosed that conventional composites are typically fiber reinforced to provide additional strength and/or flexibility, and such reinforcements include fiber of glass (col 4, lines 61-68). It is disclosed that sized fibers improves adhesion or chemical bonding; and any fiber reinforcement need to be relatively short to attain good fill, void hand lay-up, and provide a relatively homogenous

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structure, as a result, short microfibers (< 1 mm) are used (about 5mm as instantly recited) (col 4, line 61 to col 5, line 15).

It is also noted that a biplate is a two-sided component which is placed between the membrane electrode assembly in a fuel cell stack wherein its faces are oriented to the anode and cathode surface, providing electrical contact to both of the membrane electrode assembly and separating oxidant from fuel; further, the endplate is a fuel cell component which forms part of the last fuel cell compartment in a stack; if the cells are not stacked, the endplate is simply a wall of the fuel cell, the end plate provides electrical contact between an electrode and the electrical load. Thus, the endplate is simply a single-ended biplate and hence, both fuel cell components (the biplate and end plate), are electrically conductive elements. Therefore, both components can be interchangeably used within a fuel cell structure. Thus, the characteristics and properties of Wilson et al's bipolar plate also apply to the end plate.

As to claims 2 and 6 (see rejection below):

It is disclosed that glass fiber has a diameter of 16 μm (Table 1).

As to claim 10-11:

As to the method limitation, i.e. injection molding, it is noted that a method limitation incorporated into a product claim does not patentably distinguish the product because what is given patentable consideration is the product itself and not the manner in which the product was made. Therefore, the patentability of a product is independent of how it was made.

As for claim 15-16, 17-18 (see rejection below):

It is disclosed that the end plates contact end ones of bipolar plates, and are tightened to compress the stack of bipolar plates and membrane electrode assemblies between end plates (col

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3, lines 15-35). Figure 2 also shows the end plate embodiment wherein the end plate serves as a compression plate and does not necessitate a distinct and separate compression plate.

Wilson et al disclose bipolar plates according to the foregoing. However, Wilson et al do not disclose the specific glass fiber weight percent and the specific glass fiber length.

With respect to claims 1, 3, 8 (see rejection below):

Guthrie disclose end plate assemblies in a fuel cell stack (abstract) wherein the endplate header is fabricated from a polymeric material which preferably has a filler added to the extent of at least 30 % (about 30 % weight, or about 40 % weight or about 50 weight % as instantly claimed) ; a glass fiber is preferred (col 3, line 60 to col 4, line 9). The recitation "to the extent of at least 30 %" is interpreted as a polymeric material containing more than 30 % of glass fiber.

As to claims 12-13:

It is noted that the prior art of record inherently discloses the specific calculated resistance as the material and composition employed therein are substantially the same as the material and composition of the instant claims. It is also noted that the specific calculated resistance is a customized ratio of strain % properties observed from that material.

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to make the plates of Wilson et al containing the specific weight percent of glass fiber as Guthrie teaches that this specific polymeric composite provides some of the same strength and thermal expansion characteristics of the electrically conductive metal material from which the end plates are fabricated, but affords superior corrosion resistance and lighter weight. *Moreover, since the term "about" have been employed to further limit the specific weight*

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percent of glass fiber, the term "about" has been interpreted as a broader term including additional magnitudes beyond the specific range extreme values.

With respect to the specific glass fiber length, it would be obvious a glass fiber having the specific length as Wilson et al disclose that sized glass fiber possesses functional groups at the surface that can improve adhesion or provide chemical bonds to the resin. In general, these high-strength traditional fibers impart vastly improved mechanical properties in structural composites where long fibers or fabric rovings are used and the volume fractions of resin are typically quite high. In the case of electrically conductive composites for electrochemical applications, any fiber reinforcements that are used need to be relatively homogenous structure. As a result, short microfibers are utilized, thus, Wilson et al teaching's encompasses to use short length fibers.

Moreover, since the term "about" have been employed to further limit the specific weight percent of glass fiber, the term "about" has been interpreted as a broader term including additional magnitudes beyond the specific range extreme values.

8. Claims 5-9, 14 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson et al 6248467 in view of Guthrie 6048635 as applied to the preceding claims above, and further in view of Carlstrom Jr 6200698.

Wilson et al and Guthrie are applied, argued and incorporated herein for the reasons above. However, the foregoing references do not disclose the polymer being a polyphenylene sulfide.

With respect to claims (particularly) 5, 7, 9, and 14:

Carlstrom Jr discloses an end plate assembly for use in a fuel cell assembly in which the end plate assembly includes a housing formed from a plastic material such as polyphenylene sulfide (abstract/col 4, lines 18-25). It is also disclosed that the endplate assembly fixedly attach to an opposite endplate for compressing the fuel cell stack therebetween (col 2, lines 39-47).

In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to use polyphenylene sulfide to make the endplates of Wilson et al and Guthrie as Carlstrom Jr teaches that it would be appreciated that such suitable material allows the endplate assembly to be lightweight.

As to claims 6, 8, 16-18:

Refer to rejection above which contains the specific subject matter of said claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (703) 306-3326. The examiner can normally be reached on Monday-Thursday (8:30 am - 7:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (703) 308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Patrick Ryan
Supervisory Patent Examiner
Technology Center 1700